

FLIGHT

The
AIRCRAFT
ENGINEER
and
AIRSHIPS

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:

- May 11 Lecture, "Experimental Flying," by Maj. M. E. A. Wright, before I.Ae.E.
- June 23 Grosvenor Challenge Cup, Lympne
- June 25-30 International Air Congress, London
- June 30 R.A.F. Aerial Pageant
- July Air Race for King's Cup
- July 20 Gothenburg Exhibition
- Aug. 1 Entries close from British Competitors for Schneider Cup
- Aug. 3-14 Rhön Gliding Competition
- Aug. 6 Aerial Derby
- Aug. 6-27 French Gliding Competition, near Cherbourg
- Aug. 8-12 F.I.A. Conference, Gothenburg.
- Sept. Light 'Plane and Glider Competitions
- Sept. 23 Gordon Bennett Balloon Race, Belgium
- Sept. 28 Schneider Cup Seaplane Race at Cowes
- Dec. 1 Entries close for French Aero Engine Competition

1924

- Mar. 1 French Aero Engine Competition.

INDEX FOR VOL. XIV.

The Index for Vol. XIV of FLIGHT (January to December, 1922) is now ready, and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C. 2. Price 1s. per copy (1s. 1d. post free).

EDITORIAL COMMENT.



The
"Daily Mail"
Prize

NCE more the *Daily Mail* has come forward with a generous offer of a £1,000 Prize for the encouragement of aviation. The long list of donations by the Harmsworth family is already too well known to readers of FLIGHT to need repetition here, but it should be recalled that it was undoubtedly the £1,000 Prize given by the *Daily Mail* last year which brought into prominence the subject of gliders and gliding in this country. The present very lively interest in the subject of the light 'plane is largely the direct outcome of last year's gliding competition at Itford. When the announcement was made that His Grace the Duke of Sutherland, Under-Secretary of State for Air, had offered a Prize of £500 for a British machine, piloted by a British pilot, which covered the longest distance on one gallon of petrol, we welcomed the news as likely to produce a type of machine in which economy was one of the most important features.

Then came the announcement that the £1,000 Prize offered by the proprietors of the *Daily Mail* was to be awarded for exactly the same performance, i.e., mileage per gallon. While greatly appreciating the generosity of the *Daily Mail*, we felt that it was a mistake to offer this prize for the same purpose as was already covered by the Duke of Sutherland's Prize, and that by so doing the £1,000 was not likely to do as much good as it might, were it devoted to the promotion of other features than economy. We consequently addressed to the Editor of the *Daily Mail* a letter stating our point of view. This letter it was not found possible to publish in the *Daily Mail*, and we are therefore publishing it elsewhere in this issue of FLIGHT, thinking that the opinions there expressed may be of some assistance, and

in the hope that it may be the means of opening a discussion on the desirability of encouraging with prizes progress in various urgent directions in addition to economy.

As the letter deals with the subject fairly fully, although by no means exhaustively, there is little need to add anything here, beyond again pointing out that after one substantial prize has been offered for a definite object, it would not appear to be very progressive for a second and larger to be offered for precisely the same thing, when, as in this case, the larger prize could be so much more helpful if devoted to slightly different, although no less important, problems. We trust that even now it may not be found too late to reconsider the "terms of reference." For the rest we would refer our readers to our letter on p. 226.

In this connection we would also refer to a letter received by us from a correspondent. Curiously enough, our correspondent wrote his letter to us on the same date that we wrote ours to the Editor of the *Daily Mail*. Our correspondent, it will be seen from the letter published on p. 227, advances very much the same arguments as those we have used, and we think there is little doubt that there will be considerable dissatisfaction if the organisers insist upon adhering to the original decision to award the *Daily Mail* Prize for fuel economy only.

* * *

Air Regulations and the Light 'Plane

Although the light 'plane is admittedly at present in the experimental stage, sufficient has been learnt from these experiments to justify the assumption that sooner or later this type of aircraft will prove of the very greatest importance, not only as a means of establishing sporting aviation on a firm basis, but also—and more important still—as an instrument in full-scale research. The use of the light 'plane, as pointed out last week, for instruction purposes must also be contemplated, not to mention the possibilities which the light 'plane appears to offer in the way of providing the Royal Air Force with ample flying experience at relatively trifling cost. In view of these potential uses to which the light 'plane may be put, it has become necessary to examine not only the technical problems, but also the question of official regulations governing all civilian flying.

We have already repeatedly called attention to one phase of this question, *i.e.*, that of the fee to be charged for an airworthiness certificate, pointing out that the present minimum fee of £65 is far too high, due to the fact that when these regulations were drawn up the coming of the light 'plane had

not been anticipated. There are, however, other regulations which will have to be seriously considered before we can say that we are ready to go ahead with the development of the light 'plane. For instance, there is the question of the inspection and granting of certificates for these machines. If the authorities propose insisting that every light 'plane must be examined by a ground engineer before every flight, the light 'plane will be ruled out straight away. Nor does there appear to be any necessity for applying the usual rules to machines of this type. Try to imagine what would be the effect if every motorcyclist had to pass a medical examination every few months, while his machine had to be examined by a Government official before he dared bring it out of the garage. Yet this is about the position of the light 'plane unless proper provision be made for the establishment of special regulations for this latest development.

Then there is the question of pilots' licences. It will obviously be absurd to insist upon pilot-owners of light 'planes possessing the "B" class licence, and a new form of licence may have to be instituted. After all, these regulations are meant, in the first place, to safeguard anyone electing to travel by air as passengers, and, secondly, to prevent as far as possible risks to people or property on the ground. The rules of the air, such as relate to keeping to the right, not flying over towns except at a minimum altitude, throwing objects overboard, etc., will obviously have to apply to the light 'plane as to any other type of aircraft, but the licensing of pilots and machines, the inspection by Government officials, etc., will need to be entirely reconsidered.

It may be argued that we have not yet discovered what the light 'plane of the future will be like, and that, therefore, it is not possible to draft rules and regulations. On the other hand, the competition in September will undoubtedly produce a large number of light 'planes, and the interest aroused as a result of the competition will mean the placing of orders shortly after the competition, while the question of airworthiness certificates arises before any firm commences construction, so that there is little time to waste. It is no manner of good waiting until the competition is over before issuing definite rules. If that is done people who are keen just after the competition will lose interest while the authorities are thinking things over, and a serious handicap will have been imposed. May we, therefore, plead for the prompt drawing up of rules governing the use of privately-owned light 'planes, and at the same time point out that in the interest of progress such rules must be made as lenient as is possible without sacrificing the safety of either pilot or public?



Duke of York's Wedding

GROUP-CAPTAIN H.R.H. THE DUKE OF YORK, K.G., G.C.V.O., Royal Air Force, has sent the following letter of thanks to Lieut.-Col. the Right Hon. Sir Samuel Hoare, Bt., C.M.G., M.P., Secretary of State for Air:—

"I feel that I really do not know how to express my gratitude for the magnificent wedding present, which I have received from the officers and airmen of the Royal Air Force.

"I accept it with the very greatest pleasure, and ask you to convey to them an expression of my warm and sincere thanks, not only for the splendid gift which they have made to me, but also for the good wishes with which they have accompanied it.

"I appreciate with all my heart the good will which the Royal Air Force have shown towards me, and I wish all the officers and airmen to realise how grateful I am to them for this wonderful token of their loyalty and generous feeling."

The Importance of World's Records

THE recent emigration of world's records from France to the United States has not failed to cause uneasiness in French aircraft circles. This uneasiness is shared by the French Secretary of State for Air, M. Laurent Eynac, who, in an interview, said to the representative of *L'Auto*: "The American effort is extremely important, and must be given every attention. It is absolutely necessary that our constructors should attack the records. The record is the publicity of a country. It preaches the value of an industry of which it is the best means of propaganda. It is undeniable that attempts at beating world's records are always costly, and the Government must assist the constructors who engage in this work. It must either assist by defraying part of the cost, or take into account the effort of the constructors in placing orders." We should like to see our own Air Ministry take this view, and not leave it entirely to private enterprise to provide the "publicity of a country."

THE LOENING CONTROL

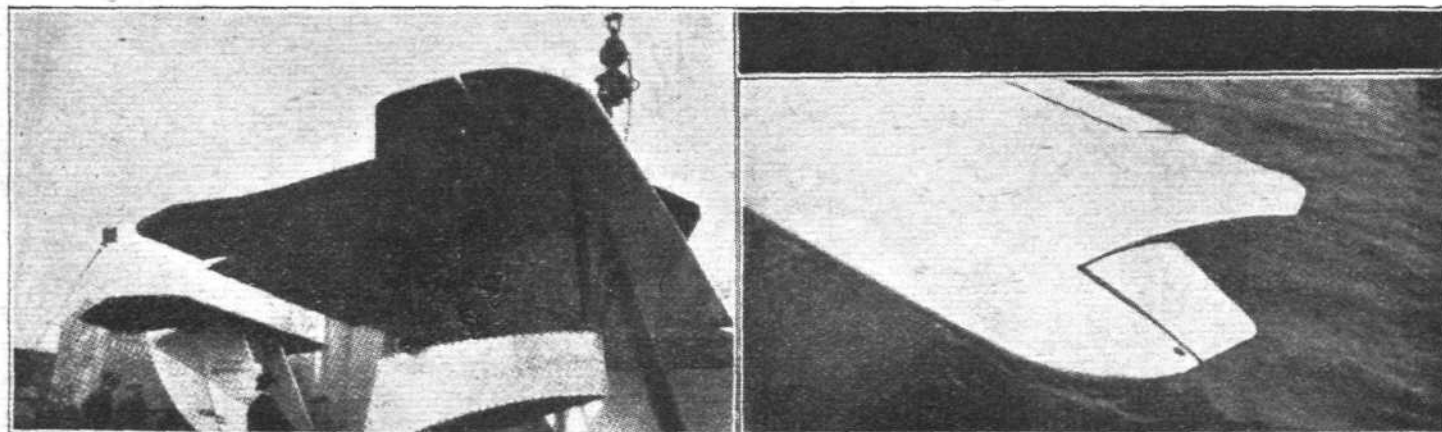
EARLY this year some tests were carried out in America with a new type of aileron control, designed by Grover C. Loening, who has produced several successful types of aeroplanes. These tests were made over the East River, N.Y. (where the factory of the Loening Aeronautical Engineering Corporation is located), under by no means ideal weather conditions, a high north-westerly and gusty wind prevailing at the time. The machine used was the Loening monoplane air yacht, owned by Harold S. Vanderbilt, whose pilot, S. W. Cogswill, carried out the tests.

This new invention, which is called a lateral "pressure equaliser," is mounted on the extreme tip of each wing, and departs radically in its effect from the orthodox forms of lateral control, where the aileron is hinged to the rear spar of the wing, at the trailing edge. Recent high-speed performances of aeroplanes have demonstrated that as the speed

stress now to be completely reversed in favour of the lateral control instead of against it. Thus the operation of the "pressure equaliser" tending to lift one side of the wing causes the angle of incidence of that side of the wing to increase, thus still further amplifying the controlling power and completely equalising the twisting stresses induced by the orthodox type of control.

In construction this "pressure equaliser" is quite simple. A small section of the leading edge of the wing is extended out beyond the tip, and to this extension is hinged the equalising flap, which is controlled from the pilot's cockpit through cables and levers. This device can be applied to any type of plane, but is most suitable for monoplanes owing to the greater depth of chord obtaining in this type of machine.

Mr. Loening claims that this new control is so effective that



Two views of the new Loening Control, or "Pressure Equaliser."

increases the ordinary aileron type of control becomes less effective and has a tendency to put twisting stresses on the wing, which neutralise the controlling effect of the ailerons and renders the machine stiff on the controls.

In the Loening "pressure equaliser" this state of affairs is avoided, because the controlling surface—which, as with ailerons in general, is intended to give more lift on one wing than on the other—is mounted forward of the centre of the wing, so that the effect of the extra lift or pressure produced by the aileron, tending to twist the wing causes this twisting

the use of the trailing edge aileron now in general use may be eliminated entirely and much more controlling power obtained with the new device with one-quarter of the area of movable surface, and with a great reduction in the energy applied to the control stick. He believes also it emphasises the qualities of the monoplane in comparison to other types of machines in that it is now possible to preserve lightness and simplicity without any sacrifice of control whatsoever, and to obtain to the best advantage the superiority in speed and climbing power.

THE LONDON-CONTINENTAL SERVICES

FLIGHTS BETWEEN APRIL 8 AND APRIL 21 INCLUSIVE

Route (including certain diverted journeys)	No. of flights*	No. of passengers		No. of flights carrying		No. of journeys completed†	Average flying time	Fastest time made by	Type and (in brackets) Number of each type flying
		No. of passengers		Mails	Goods				
Croydon-Paris ...	61‡	146	21	34	58	h. m.	3 9	H.P.W.8 3 G-EBBH (2h. 25m.)	B. (3), G. (14), H.P.W.8B. (2), Sp. (2).
Paris-Croydon ...	51	314	11	38	47	2 41		H.P.W.8B G-EBBH (1h. 32m.)	B. (3), G. (13), H.P.W.8B. (2), Sp. (2).
Croydon-Brussels-Cologne	15	73	12	12	15	4 14		D.H. 34 G-EBBR (3h. 22m.)	D.H. 4 (1), D.H. 18 (1), D.H. 34 (3).
Cologne-Brussels-Croydon	15	86	12	3	15	3 48		D.H. 34 G-EBBR (2h. 47m.)	D.H. 4 (1), D.H. 18 (1), D.H. 34 (3).
Croydon-Rotterdam ...	12	11	12	12	12	2 54		Fokker H-NABG (2h. 22m.)	F. (7).
Rotterdam-Croydon ...	12	23	12	12	12	2 36		Fokker H-NABH (2h. 15m.)	F. (6).
Manchester-Croydon-Amsterdam	13§	44	—	4	12	5 37		—	D.H. 34 (4).
Amsterdam-Croydon-Manchester	13	40	10	3	13	5 11		—	D.H. 34 (4).
Total for two weeks ...	192	737	90	118	184				

* Not including "private" flights.

† Including certain journeys when stops were made *en route*.

‡ Croy.-Lym. 8, Lym.-L.B. 8.

§ Man.-Croy. 2, Croy.-A'dam. 2.

|| A'dam.-Croy. 2, Croy.-Man. 2.

Av = Avro.

B. = Breguet.

Br. = Bristol.

Bt. = B.A.T.

D.H.4. = De Havilland 4.

D.H.9. (etc.).

F. = Fokker.

Fa. = Farman F.50.

G. = Goliath Farman.

H.P. = Handley Page.

M. = Martinsyde.

Sp. = Spad.

Vi. = Vickers Vimy.

Vu. = Vickers Vulcan.

W. = Westland.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

COMMITTEE MEETING

A Meeting of the Committee was held on Wednesday, April 18, 1923, when there were present:—Lieut.-Col. F. K. McClean, A.F.C., in the Chair; Mr. Ernest C. Bucknall, Lieut.-Col. M. O. Darby; Lieut.-Col. John D. Dunville, C.B.E.; Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.; Col. F. Lindsay Lloyd, C.M.G., C.B.E.; Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P.; Capt. D. G. Murray; Lieut.-Col. A. Ogilvie, C.B.E.; Lieut.-Col. M. O'Gorman, C.B.; Air-Commodore C. R. Samson, C.M.G., D.S.O., R.A.F.; and the Secretary.

Election of Chairman.—On the motion of Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., seconded by Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Lieut.-Col. F. K. McClean, A.F.C., was unanimously elected Chairman of the Club for the current year.

On the motion of Lieut.-Col. F. K. McClean, A.F.C., seconded by Lieut.-Col. M. O'Gorman, C.B., a unanimous vote of thanks was passed to Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., the retiring Chairman.

Election of Vice-Chairman.—On the motion of Lieut.-Col. F. K. McClean, A.F.C., seconded by Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Lieut.-Col. John D. Dunville, C.B.E., was unanimously elected Vice-Chairman of the Club for the current year.

Election of Members.—The following new Members were elected:—

Major Ernest Leslie Foot.
Arthur George Loton.

Stewards of the Club.—The following were elected the Stewards of the Club for the current year:—

Brig.-Gen. The Duke of Atholl, K.T., G.C.V.O., D.S.O.
The Right Hon. Lord Hugh Cecil, M.P.

The Earl of Halsbury.

Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.

Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P.

Admiral of the Fleet the Right Hon. Sir Edward Seymour, G.C.B., O.M.

Appointment of Sub-Committees.—The following Sub-Committees were appointed for the current year:—

Racing Committee.—Maj.-Gen. Sir W. S. Brancker, K.C.B.; Lieut.-Col. W. A. Bristow; Capt. R. J. Goodman Crouch; Lieut.-Col. M. O. Darby; Lord Edward Grosvenor; Col. F. Lindsay Lloyd, C.M.G., C.B.E.; W. O. Manning; Lieut.-Col. A. Ogilvie, C.B.E.; Air-Commodore C. R. Samson, C.M.G., D.S.O., R.A.F.

House Committee.—Major H. Graeme Anderson; Ernest C. Bucknall; Major Herbert J. Corin; D. C. MacLachlan; J. Stewart Mallam; Capt. D. G. Murray; Capt. L. V. Pearkes; Major S. V. Sippe, D.S.O.

Technical Committee.—Griffith Brewer; Eng.-Com. W. Briggs, R.N.; Major R. H. Mayo; Capt. D. G. Murray; Lieut.-Col. A. Ogilvie, C.B.E.; Lieut.-Col. M. O'Gorman, C.B.

Finance Committee.—Ernest C. Bucknall; Lieut.-Col. M. O. Darby; J. Stewart Mallam; Lieut.-Col. A. Ogilvie, C.B.E.

Flying Services Fund Committee.—H.R.H. The Duke of York, K.G.; Group-Capt. F. W. Bowhill, C.M.G., D.S.O., R.A.F.; Lieut.-Col. Alan Dore, D.S.O.; Chester Fox; Wing-Commander T. O'B. Hubbard, M.C., R.A.F.; Capt. D. G. Murray; Air-Commodore C. R. Samson, C.M.G., D.S.O., R.A.F.

Library Committee.—C. G. Grey; Major C. C. Turner; Howard T. Wright.

The Chairman (Lieut.-Col. F. K. McClean, A.F.C.); Vice-Chairman (Lieut.-Col. John D. Dunville, C.B.E.); Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.; and Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., are *ex-officio* Members of all Sub-Committees.

Racing Committee.—Report of Meeting of Racing Committee held on April 13, 1923, was received and adopted.

Flying Services Fund.—The report of the Meeting of the Flying Services Fund Committee held on March 29, 1923, was received and adopted.

Mr. Ernest C. Bucknall was appointed Honorary Treasurer

of the Fund to fill the vacancy caused by the death of Lord Kinnaid.

Special Conference of the F.A.I., Paris, March 20, 1923.—Lieut.-Col. M. O'Gorman, C.B., reported on the Special Conference of the F.A.I., held in Paris on March 20, 1923.

The following items were included in the Report:—

1. Powers of Commissaires Sportifs. The Paris Conference decided that in no circumstances could the Commissaires Sportifs alter the Regulations of a Competition.

2. World Atlas of Landing Grounds.

3. Timing of Speed Records.

4. Customs Carnet for Touring Aircraft.

The question of timing speed records was referred to the Technical Committee.

The Report was adopted, and a unanimous vote of thanks passed to Col. O'Gorman for attending the Conference on behalf of the Club.

Aviator's Certificate.—The following Aviator's Certificate was granted.

7940 James Colin Montgomery, March 21, 1923.

GLIDING COMMITTEE

A Meeting of the Gliding Committee was held on Monday, March 26, 1923, when there was present:—Lieut.-Col. F. K. McClean, A.F.C., in the Chair; Mr. E. C. Gordon England; Major O. T. Gnosspeilus; Mr. W. O. Manning; Mr. F. Handley Page; Capt. W. H. Sayers; and the Secretary.

Motor Glider Competition.—The Secretary submitted memorandum received from the Duke of Sutherland, setting out schemes for a competition. It was decided to recommend that the total cylinder capacity should not exceed 750 c.c., and that the fuel allowance should be limited to one gallon.

It was decided to approach the Air Ministry regarding certain modifications of the Air Navigation Regulations for the purposes of the Competition.

A further Meeting was held on April 13, 1923, when there were present:—Lieut.-Col. M. O. Darby, in the Chair; Mr. E. C. Gordon England; Major O. T. Gnosspeilus; Mr. W. O. Manning; Lieut.-Col. A. Ogilvie, C.B.E.; Mr. F. Handley Page; Capt. W. H. Sayers. In attendance: Brig.-Gen. R. K. Bagnall-Wild, C.M.G., C.B.E., and the Secretary.

Duke of Sutherland Prize.—The Regulations were drafted for the Competition for the Prize of £500 offered by the Duke of Sutherland. It was decided that the Prize should be awarded for the longest distance accomplished on a British machine flown by a British pilot, with a fuel allowance of one gallon. It was also decided to include a test of transport.

"Daily Mail" Prize.—The Chairman and Secretary reported their interview with the *Daily Mail*, who had offered a prize of £1,000 open to all countries. It was decided to recommend that the competition should be on similar lines to that already fixed for the Duke of Sutherland Prize, and that the two competitions should be held at the same time.

Permanent Gliding Quarters.—Letter was read from the Air Ministry offering to make a grant of £500 to the Club towards the expenses of establishing permanent quarters for the encouragement and development of gliding. The Secretary was instructed to report as to a suitable site, and also cost of shed accommodation.

RACING COMMITTEE

A Meeting of the Racing Committee was held on Friday, April 13, 1923, when there were present:—Lieut.-Col. M. O. Darby, in the Chair; Mr. W. O. Manning; and the Secretary.

Motor Glider Competition.—It was reported that the Duke of Sutherland had offered a prize of £500 open to British machines flown by British pilots.

It was further reported that the proprietors of the *Daily Mail* had offered a prize of £1,000, open to all countries.

The Regulations as drafted by the Gliding Committee were considered and approved.

Whitsuntide Race Meeting.—It was decided not to hold a race meeting at Whitsuntide.

Grosvenor Challenge Cup.—The draft Regulations were considered and approved.

THE GROSVENOR CHALLENGE CUP

(Under the Competition Rules of the Royal Aero Club.)

LORD EDWARD GROSVENOR has presented to the Royal Aero Club a Challenge Cup to be competed for each year, with a First Prize of £100 and a Second Prize of £50.

The Grosvenor Challenge Cup for the year 1923 will be awarded to the entrant of the aeroplane which first completes the course in a Point-to-Point Handicap Race under the following conditions:—

Supplementary Regulations

Date.—The race will take place on Saturday, June 23, 1923.

Organisation.—The race shall be conducted by the Royal Aero Club under the Competition Rules of the Royal Aero Club.

Competitors.—The entrant and pilot or pilots must be British subjects. The entrant must be an individual and not a company.

Aeroplane.—The aeroplane, including the engine, must have been entirely constructed in the British Empire. The engine must not develop more than 150 h.p. The following are eligible:—

	h.p.
Le Rhone	80 and 110 (British made).
Gnome	80 and 100 (British made).
Clerget	110 and 130 (British made).
Renault	75 and 80 (British made).
R.A.F.	90 and 140.
Beardmore	120
Bristol Lucifer	100
Rolls-Royce Hawk	75
A.B.C. Gnat	45
Green	35
Bristol Cherub	18

The use of any engine not included in the above list is subject to the approval of the Royal Aero Club.

Entries.—The entry fee is £2. This fee, together with the entry form, must be received by the Royal Aero Club, 3, Clifford Street, London, W. 1, not later than 12 noon, on Wednesday, June 13, 1923.

Air Navigation Regulations.—Competitors must comply with the Air Navigation Regulations in force.

Course.—Lympe (starting place) to Croydon, 55 miles; Croydon to Castle Bromwich, 106 miles; Castle Bromwich to

Bristol, 85 miles; Bristol to Croydon, 103 miles; Croydon to Lympe (finish), 55 miles; total, 404 miles.

Stopping at Controls.—Competitors must make a compulsory stop (the duration of which will be announced later) at each of the above Controls. The time of arrival will be taken at the moment the aeroplane comes to rest within the boundary of the Control.

Starting.—Competitors will be started from Lympe aerodrome in accordance with their handicap.

Landing.—Landings between Controls are allowed.

Arrival at Lympe.—Competitors on arriving at Lympe aerodrome must cross the finishing line (i.e., white line with white cross at each end) in flight. This may be done in either direction.

Time Cards.—Competitors before starting will be supplied with a time card. The competitor is alone responsible for the safe custody of his card, and for its being produced and entered up at each Control.

General.—1. A competitor, by entering, thereby agrees that he is bound by the Regulations herein contained or to be hereafter issued in connection with this competition.

2. The interpretation of these Regulations or of any hereafter issued shall rest entirely with the Royal Aero Club.

3. The competitor shall be solely responsible to the Officials for the due observance of these Regulations, and shall be the person with whom the Officials will deal in respect thereof, or of any other question arising out of this competition.

4. A competitor, by entering, waives any right of action against the Royal Aero Club and Lord Edward Grosvenor for any damages sustained by him in consequence of any act or omission on the part of the Officials of the Royal Aero Club or their representatives or servants or any fellow competitor.

5. The aeroplane shall at all times be at the risk in all respects of the competitor, who shall be deemed by entry to agree to waive all claim for injury either to himself, or his passenger, or his aeroplane, or his employees or workmen, and to assume all liability for damage to third parties or their property, and to indemnify the Royal Aero Club and Lord Edward Grosvenor in respect thereof.

6. The Committee of the Royal Aero Club reserves to itself the right to add to, amend, or omit any of these rules should it think fit.

THE DUKE OF SUTHERLAND MOTOR GLIDER COMPETITION

(Under the Competition Rules of the Royal Aero Club.)

THE prize of £500 presented to the Royal Aero Club by the Duke of Sutherland, will be awarded to the competitor who accomplishes the longest distance in one flight, providing such flight is not less than 50 miles, under the following conditions:—

Supplementary Regulations No. 1

Date.—The competition will be held in September or October next, and the exact date will be announced later.

Organisation.—The competition will be conducted by the Royal Aero Club.

Place of Contest.—The locality has not yet been definitely decided upon, and will be announced later.

Competitors.—The entrant and pilot must be British subjects.

Motor Glider.—The competition is open to any heavier-than-air machine with engine, the total cylinder capacity of which must not exceed 750 c.c. The machine and engine must have been entirely constructed in the British Empire. Any additional motive power produced by the personal exertions of the occupants during flight is allowed. The machine must not be supported either wholly or in part by any gas which is lighter than air.

Competitors may use any launching device provided by themselves.

Fuel Allowance.—One gallon only will be allowed. The fuel is to be such as can be commercially obtainable in bulk.

Pilot.—The weight of the pilot must be made up to a minimum of 168 lbs.

Transport.—Competitors must demonstrate to the officials that the machine is capable of being transported on the ground a distance of one mile by not more than two persons without

the use of any extraneous tackle, within a period not exceeding three hours. The selected course for this test will include the getting out of a field through an ordinary gateway, 10 ft. wide, and proceeding along a 15 ft. road, occupying not more than half the width of the road. This test must be satisfactorily passed before any distance flight in the competition is made.

Course.—The distance flight will be made over a triangular course of not less than 15 miles, and will have a range of hills on one side. The start will be from a hill in the locality selected for the competition.

There is no restriction as to the number of attempts a competitor may make.

Distance of Flight.—The distance of flight will be measured from the official starting-point on the hill, over the course, to the nearest point on the course at which the machine alights.

Entries.—The entry fee is £5. This fee, together with the entry form, must be received by the Royal Aero Club, 3, Clifford Street, London, W. 1, not less than 7 days prior to the date fixed for the start of the competition. (This also covers entry for the *Daily Mail* prize of £1,000.)

The Royal Aero Club, in the interests of safety, reserves to itself the right to refuse any entry and/or to prohibit the flight in the competition of any competitor if it considers the flight would be dangerous.

Accommodation.—Information as to accommodation for the competing machines will be issued later.

Air Navigation Regulations.—Competitors must comply with the Air Navigation Regulations in force, subject to any concessions which may be made by the Air Ministry for this competition.

THE "DAILY MAIL" MOTOR GLIDER COMPETITION

(Under the Competition Rules of the Royal Aero Club and the Regulations of the Fédération Aéronautique Internationale.)

THE prize of £1,000 offered by the proprietors of the *Daily Mail* will be awarded to the competitor who accomplishes the longest distance in one flight, providing such flight is not less than 50 miles, under the following conditions:—

Supplementary Regulations, No. 1.

Date.—The competition will be held in September or October next, and the exact date will be announced later.

Organisation.—The competition will be conducted by the Royal Aero Club.

Place of Contest.—The locality has not yet been definitely decided upon, and will be announced later.

Competitors.—The competition is open to persons of any nationality holding a licence issued by any Aero Club affiliated to the Fédération Aéronautique Internationale. (Note.—Licences for British competitors will be issued by the Royal Aero Club.)

Motor Glider.—The competition is open to any heavier-than-air machine with engine, the total cylinder capacity of which must not exceed 750 c.c. Any additional motive power produced by the personal exertions of the occupants during flight is allowed. The machine must not be supported either wholly or in part by any gas which is lighter than air.

Competitors may use any launching device provided by themselves.

Fuel Allowance.—One gallon only will be allowed. The fuel is to be such as can be commercially obtainable in bulk.

Pilot.—The weight of the pilot must be made up to a minimum of 168 lbs.

Transport.—Competitors must demonstrate to the officials that the machine is capable of being transported on the ground a distance of one mile by not more than two persons without the use of any extraneous tackle, within a period not

exceeding three hours. The selected course for this test will include the getting out of a field through an ordinary gateway, 10 ft. wide and proceeding along a 15 ft. road, occupying not more than half the width of the road. This test must be satisfactorily passed before any distance flight in the competition is made.

Course.—The distance flight will be made over a triangular course of not less than 15 miles, and will have a range of hills on one side. The start will be from a hill in the locality selected for the competition.

There is no restriction as to the number of attempts a competitor may make.

Distance of Flight.—The distance of flight will be measured from the official starting point on the hill, over the course, to the nearest point on the course at which the machine alights.

Entries.—The entry fee is £5. This fee, together with the entry form, must be received by the Royal Aero Club, 3, Clifford Street, London, W. 1, not less than 7 days prior to the date fixed for the start of the competition.

The Royal Aero Club, in the interests of safety, reserves to itself the right to refuse any entry, and/or to prohibit the flight in the competition of any competitor if it considers the flight would be dangerous.

Accommodation.—Information as to accommodation for the competing machines will be issued later.

Air Navigation Regulations.—Competitors must comply with the Air Navigation Regulations in force, subject to any concessions which may be made by the Air Ministry for this competition.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary.

LIGHT 'PLANE AND GLIDER NOTES

THE announcement that the *Daily Mail* has offered a Prize of £1,000 for light 'planes will be received with general satisfaction. The encouragement thus given cannot fail to do a great deal of good, and all who take an interest in aviation will feel duly grateful to the *Daily Mail* for this latest effort to help forward the good cause. We must, however, admit that we are somewhat disappointed that it has been decided to award the *Daily Mail* £1,000 for the same performance, i.e., mileage per gallon of petrol, as that asked for by the rules of the Prize of £500 offered by the Duke of Sutherland. It seems to us that by so doing, although the *Mail* Prize is international while the Sutherland Prize is for British pilots on British machines, there will be a duplication which must result in lessening the benefit which the splendid offer of the *Daily Mail* confers upon the development of the light 'plane.

ON April 20 we sent to the Editor of the *Daily Mail* a letter stating the reasons why we thought it a mistake to offer the Prize for the same performance, and received a letter from the Editor stating that he regretted that the *Mail* were not able to publish our letter, but that it had been forwarded to the Royal Aero Club, who are the organisers of the competition. As we think the matter is one which is of considerable importance, we are publishing our letter to the *Daily Mail* below, hoping that it may be of interest and that it may not yet be too late to reconsider the position. There is little to add to the statements made in this letter, as the ground has been covered fairly fully. The suggestions which we made can easily be elaborated to any desired extent, and several more items could be incorporated in the rules. Most of the tests suggested should be possible without an unduly expensive organisation, and the very fact that other qualities than economy were taken into consideration could scarcely fail to assist materially in producing machines of really practical value. With but one object in view—that of economy—it seems likely that other desiderata will be ignored, or at any rate be given but minor consideration, whereas by placing a premium upon other qualities such as reliability, etc., in addition to economy, a more generally useful type of machine is, we think, likely to be evolved.

FOLLOWING is the text of our letter to the Editor of the *Daily Mail*:—

We have read with the greatest interest the announcement

made in the *Daily Mail* of this morning of the offer of a prize of £1,000 for light aeroplanes. While greatly appreciating the generosity which has prompted the proprietors of the *Daily Mail* to add to its long list of gifts to aviation another £1,000, for the furtherance of economical flying, we desire to put forward certain suggestions, with the object of ensuring that the very generous prize offered shall be of the maximum benefit to the development of the light 'plane.

Initially we would point out that the term "motor glider" is a contradiction in itself. The word "glider" indicates an aeroplane without engine, and it logically follows that a "motor glider" is "an engineless aeroplane with an engine," which is, one might say, an "Irishism." The type of aeroplane which comes into consideration for the proposed competition is simply an aeroplane with an engine of small capacity, and bears exactly the same relation to the large aeroplane as does the light car to the large car. For several months past we have referred to this type of machine as a "light aeroplane," and this term is, we venture to think, likely to be adopted generally. No doubt this will in time be abbreviated to "light 'plane," the term in which we have lately referred to it. The point is, perhaps, a minor one, but it is as well to start right on a subject which is bound in time to become one of the utmost importance.

With regard to the conditions under which the £1,000 prize is offered, we regret to note that it is proposed to award the prize for exactly the same performance as that for which His Grace the Duke of Sutherland is offering a prize of £500, and, if not too late, would strongly urge that the position be reconsidered. Otherwise the magnificent gift is likely to be largely wasted (assuming that the main object is to help forward progress in aviation), as a brief consideration of the position should indicate.

The very fact that the engine capacity is limited to 750 c.c. ensures fairly good economy. For instance, the maximum power which can reasonably be expected from an engine of this capacity is about 25 b.h.p. The petrol consumption, to take a high figure, may be assumed to be 0.7 pint per h.p. per hour, or 17.5 pints (nearly 2½ gallons) per hour, with the engine running at full power. The speed of the aeroplane with the engine developing 25 h.p. will certainly be at least 65 m.p.h., which gives a mileage of just under 30 miles per gallon under the most uneconomical conditions. By throttling down the engine and flying at the best cruising speed the economy can be increased to at least 50 miles per gallon, and probably more. The rules governing the Duke of Sutherland's prize place a premium on economy, and by

using smaller engines a consumption of 80 miles per gallon will undoubtedly be attained.

Now, what is likely to be the result of adding £1,000 to the prize already offered? It will undoubtedly be to produce machines of the utmost economy, but, and this is the crux of the whole matter, economy at all costs (if one may use such an expression). Thus it is conceivable that a machine may be produced which will do (say) 120 miles per gallon in still air, but such a machine would probably be utterly useless for any practical purposes after the competition.

May we therefore suggest that as it is really of no practical consequence whether a machine does 80 miles per gallon or 90 miles per gallon, the limit on engine capacity and the offer of £500 for the best mileage will ensure all the economy that is necessary, and that the splendid gift of the *Daily Mail* may be awarded for other purposes?

As destructive criticism is of little value without constructive suggestions, we would urge very strongly that the *Daily Mail* £1,000 be devoted to bringing out other qualities than, but additional to, that of economy. Thus we would suggest that the machines competing for the *Daily Mail* prize should be the same as those entering for the Sutherland prize, but that marks be awarded for a series of performances other than mileage per gallon. For instance, one of the greatest difficulties in connection with the light 'plane will probably be found to be that the climb will not be very good, cannot well be good with the relatively high-power loading. It is, however, of great importance to make it as good as possible, and we suggest that marks should be awarded for the best climb. In this we would judge the merits on "angle of climb" rather than on "rate of limb," as it is really the former which matters.

Again, for cross-country flying it is important that the cruising and maximum speeds should be reasonably good, and we suggest that marks should be awarded for speed. Low landing speed is essential for safety, and marks for low landing speed, or, in other words, for "speed range," should be awarded.

Stability and controllability are assets which are also of the greatest importance, and although it is somewhat difficult to judge these qualities, there being no standard upon which to base a comparison of merits, it should not be impossible to devise a series of tests which would give a fairly good indication of the stability and controllability of the machines entered.

Reliability is another essential feature—more important even than economy—which the light 'plane should possess if it is to be of practical value, and it should be possible to frame rules for a series of reliability tests, awarding marks in proportion to the percentage of reliability attained by the various competitors. For instance, as it is, apparently, intended to hold the competitions during one week, all competitors might be required to fly a certain distance every day, no matter what the weather conditions, and the highest marks would then be awarded to the competitor who attained, or most nearly so, to the 100 per cent. reliability.

Several other awards of marks could be suggested, but we think sufficient has been said to indicate the lines which might, we think, be advantageously followed. We are quite certain that if some system of awarding marks such as we have suggested be adopted, the result will be that the competition will produce light 'planes which are really of practical value, and not mere freaks built for one single purpose and for no other—and that simply the securing of the cash prize offered.

In conclusion, may we point out that, although it is very sporting of the *Daily Mail* to make their handsome prize International, having regard to the fact that other countries, like France, Germany, etc., almost invariably confine their competitions to pilots and machines of their own nationality, is it not time that we on this side sat up and took practical notice of this exclusiveness?

In connection with the Sutherland Prize we have received from a correspondent the following letter:

"I have read with interest the announcement in your issue of the 12th regarding the Duke of Sutherland's Prize. Might I be allowed to offer a little comment and suggestion? The idea I take it is to encourage the development of a machine with low petrol consumption, at the same time, it seems essential that a reasonably high speed should be maintained as this is one of the main advantages of air as compared with other forms of transit. Secondly, it is necessary to retain a good standard of strength to ensure safety. Now these two points do not seem to have been kept in view in connection with the competition. Moreover, the 750 c.c. limit seems to be quite unnecessary as the fact that the competition is for mileage at once limits the power required to a

level probably much lower than this. That is to say, the boundary line seems to have been fixed at the wrong end altogether.

Since the competition is spread over a week, it is fairly certain that competitors will be able to get a few hours of calm or comparative calm in which to make attempts. If that is so then machines flying at something under 30 m.p.h. will almost certainly win. Now, is a machine of this speed worth encouraging? Would it not be better to stipulate that the competing machine must have covered its distance at an average ground speed of at least 45 m.p.h. or some such figure in this region? It would appear to be quite easy to turn out a machine to have this speed and be well above the 50 m.p.g. limit.

In your editorial comment you say that "a certain speed will have to be maintained in order to cover a maximum distance," but in this connection it should be remembered that it is the amount of "work done" that is rationed (1 gall. of petrol). Therefore, since it is distance that is required, the head resistance is the item which must be kept at a minimum and this, of course, means the "freak machine of such light loading and low speed as to make it of no use for ordinary flying." Granted that this only applies with accuracy to still air, but a few hours of approximate calm will probably be available. Regarding the strength, it might be as well to fix a minimum factor of safety to prevent machines being made dangerously weak in order to save power.

These two points are, I think worthy of careful consideration for at present it looks as though the prize will go to a very flimsy machine of 2 h.p., 25 m.p.h. and 150 m.p.d.

W. E. GRAY

Edrington Castle,
Berwick-on-Tweed.

April 20, 1923.

P.S.—I am at present building a glider myself which with a small engine would do about 120 m.p.g. at 30 m.p.h., but then that is not a very useful machine and would probably require a hill or Sandow to start it, both of which are undesirable features."

In the French Press there is at present quite a lively discussion going on relating to the merits of the Dewoitine light 'plane, some maintaining that it is but a small step forward from the "Demoiselle" of Santos Dumont of 1909 vintage, while others claim the performance as something really astonishing. As usual in such cases, the truth seems to be somewhere in between the two extremes.

For instance, the weight of the Dewoitine is stated to be 555 lbs. "all on." The engine fitted is a flat twin, or horizontally opposed, Anzani air-cooled, of 1,100 c.c. capacity. On the face of it, therefore, it seems rather extraordinary that the engine should not develop more than 8 h.p. at 1,450 r.p.m. and 7 h.p. at 1,350 r.p.m., which is stated to have been the speed of the engine when Barbot was taking off. The speed of the Dewoitine is stated to have been 56 m.p.h., or 82 ft./sec. Assuming that the airscrew efficiency at this speed was 75 per cent., which seems to be a reasonable figure, the thrust developed would be

$$\frac{550 \times 7 \times .75}{82} = 35.2 \text{ lbs.}$$

As the weight of the machine is 555 lbs., the L/D ratio at maximum speed would be $\frac{555}{35.2} = 15.7$.

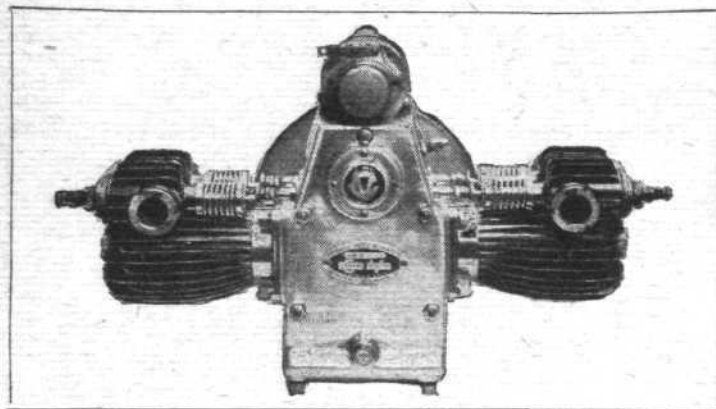
This seems rather a high ratio at maximum speed, and if we subtract the resistance of the undercarriage, which may be assumed to be about 10 lbs., corresponds to a gliding angle of 1 in 22. So far as we are aware, none of the gliders at Itford (which were mostly without exposed undercarriage) had a gliding angle of anything approaching 1 in 22. It seems much more likely that the engine develops considerably more than 7 h.p., which, a rough estimate indicates, would correspond to an M.E.P. of only 56.6 lbs./sq. in. It may be assumed that Anzani would scarcely produce an engine of such low M.E.P., and that the real figure is nearer 90 lbs./sq. in. If that is the case the actual power would be about 11 h.p., and at 82 ft./sec. and with 75 per cent. propeller efficiency would give a thrust of 56 lbs., giving an L/D ratio of 9.9, which seems much more reasonable. Incidentally it is of interest to note that the power curve of the Bristol "Cherub," published on p. 118 of our issue of March 1, 1923, indicates a b.h.p. of 11 at 1,350 r.p.m. The Bristol "Cherub" is of approximately the same capacity as the Anzani, and the M.E.P. is about 90 lbs./sq. in. On the whole, therefore, it seems more reasonable to suppose that the Anzani of the Dewoitine light 'plane developed 11 h.p., when the power loading with which the machine got into the air works out at about 50 lbs./h.p., instead of the 78.5 lbs./h.p. claimed for it.

CYCLE ENGINES FOR LIGHT 'PLANES

The Coventry Victor 688 c.c. Flat Twin

Two models of engines are manufactured by the Coventry Victor Motor Co., Ltd., of Coventry, both flat twin, or horizontally-opposed, air-cooled of a capacity within that specified as maximum for the competition for the Duke of Sutherland's prize. A similar engine, but water-cooled, is also produced by this firm for use in boats, but this scarcely comes into consideration for light 'planes.

The standard Coventry Victor engine is shown in the



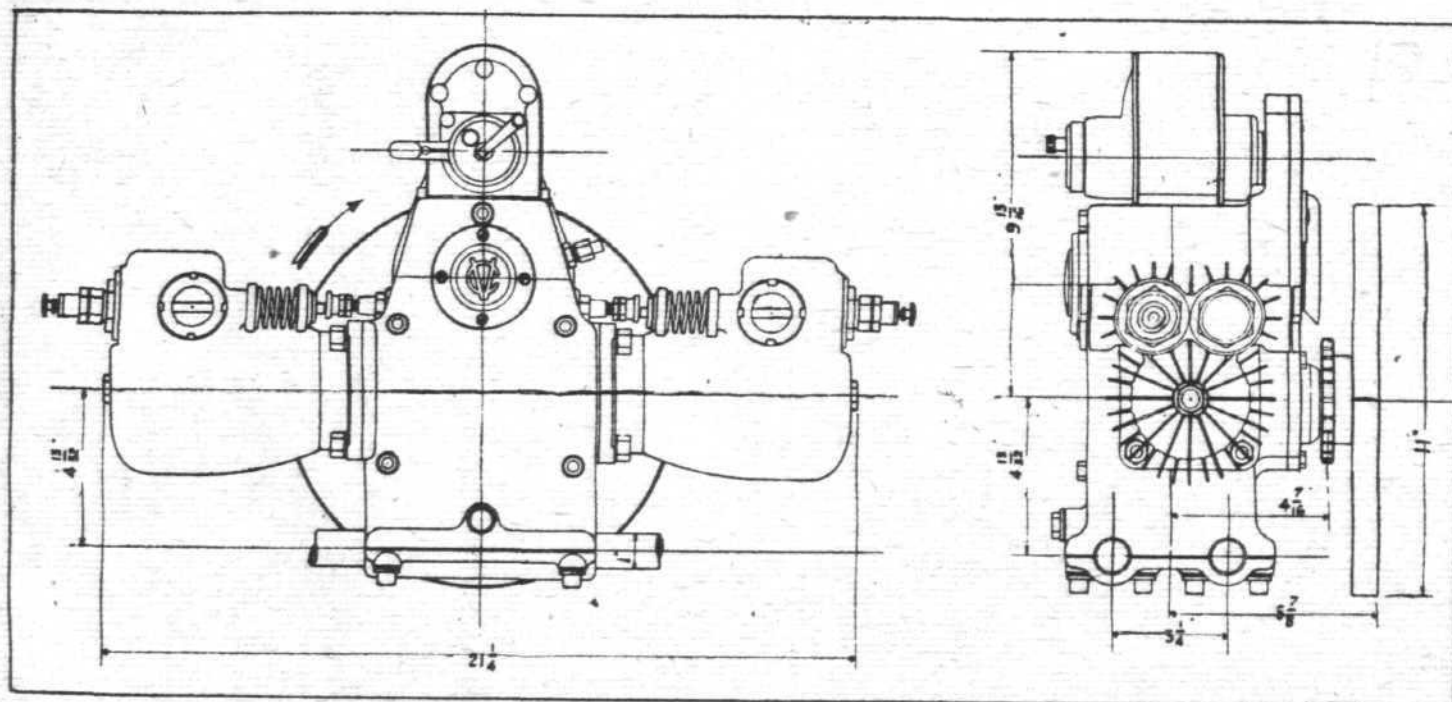
The Coventry Victor Flat Twin.

accompanying line drawings and photograph. The valves are housed in ribbed valve cages on the side of the cylinders, and as distinct from usual practice the fins of the cylinders run parallel with the cylinders instead of circumferentially

to the standard engine, will develop about 20 h.p. The standard engine is of fairly low compression, but is very flexible and reliable, and might develop sufficient power. The "Super-Sports" engine has a higher compression, and consequently greater power for the same capacity.

Lubrication is quite automatic, and the external flywheel is another feature which makes the engine suitable for light 'planes, as a lighter flywheel can be substituted if it is found that the standard heavy one is not required. The weight of the standard engine complete is, we believe, about 70 lbs., and the price is £30 complete with magneto. The "Super-Sports" model costs a little more—£35 complete with flywheel—and we understand from Mr. W. A. Weaver, managing-director of the firm, that the Coventry Victor Motor Co., Ltd., is prepared to build a special engine, intermediate between the standard and racing models, without extra charge. Anyone intending to experiment with light 'planes should communicate with the firm, when Mr. Weaver will be pleased to co-operate in the manner indicated above.

The main dimensions of the Coventry Victor engine are indicated in the accompanying line drawings. The overall width over cylinder heads is $21\frac{1}{4}$ ins., and the height from engine bearers to top of magneto is $14\frac{3}{4}$ ins. The engine bearers, which are 1 in. diameter, are spaced $3\frac{1}{2}$ ins. apart. A fairly large flywheel, 11 ins. diameter and of substantial weight, should ensure very smooth running indeed, and it is even conceivable that for use in a light 'plane this might be removed altogether. On the other hand, the relatively few extra pounds' weight should not make a great deal of difference to the performance of a machine, while retaining the flywheel, with the added flywheel effect of the propeller, should reduce vibration to a minimum, a fact which might easily be of greater importance than the saving of a few pounds in weight.



THE COVENTRY VICTOR FLAT TWIN : This engine has a capacity of 688 c.c., and develops approximately 20 h.p. The dimensions given are sufficient to enable designers to ascertain how the engine would fit into a machine.

around them. The bore and stroke are 75 mm. by 78 mm. respectively, giving a cylinder capacity of 688 c.c., which is thus well within the limit of 750 c.c. stipulated. The square crank-case is provided with a plate bolting on to tubular supports, normally the frame of the bicycle. In a light 'plane no great alteration appears to be necessary, and it should be possible to use as engine bearers two tubes running transversely and attached to the fuselage longerons or to upright struts between upper and lower longerons. We have not been able to obtain from the makers a power curve, but it is stated that the racing engine, which is generally similar

Although a sprocket is provided just inside the flywheel, it should be possible, if desired, to alter the engine to direct drive. As we do not know the speed of the engine, we cannot express an opinion as to whether chain transmission or direct drive would be to be preferred. With a short silent chain there should be no great objection to chain transmission, and it is fairly safe to assume that better propeller efficiency would be obtained with geared-down propeller. However, that is a question into which no doubt the manufacturers will be pleased to go with anyone contemplating the fitting of a Coventry Victor.

"FLIGHT" GLIDER DESIGNING COMPETITION*

"TURKEY BUZZARD"

THE WING CONSTRUCTION

In several respects the wing construction of "Turkey Buzzard" is unusual. For instance, the ribs have webs of stiff paper, with double flanges as in the Fokker machines, i.e., the web runs to the full depth of the section, and the two halves of the flange are then attached, one on each side of the flange. In the Fokkers the web was usually of 1 mm. three-ply wood, but Miller and Brown have chosen stiff paper instead. The material called for in the specification is "90 Armorplate Kraft Paper," but as this appears to be an unknown commodity in this country presumably a good stiff cartridge paper may be used instead.

The wing spars are of built-up I-section, with webs of $\frac{1}{8}$ in. three-ply mahogany, and split flanges of spruce. In order to avoid confusion, it may be pointed out that the designers of "Turkey Buzzard" use the word "beam" where we use "spar" (incidentally, beam is a better word, as the wing spars are actually beams, and the formulae for beams are used in stress calculations), and "cap strips" where we use "rib flanges."

Wing Ribs

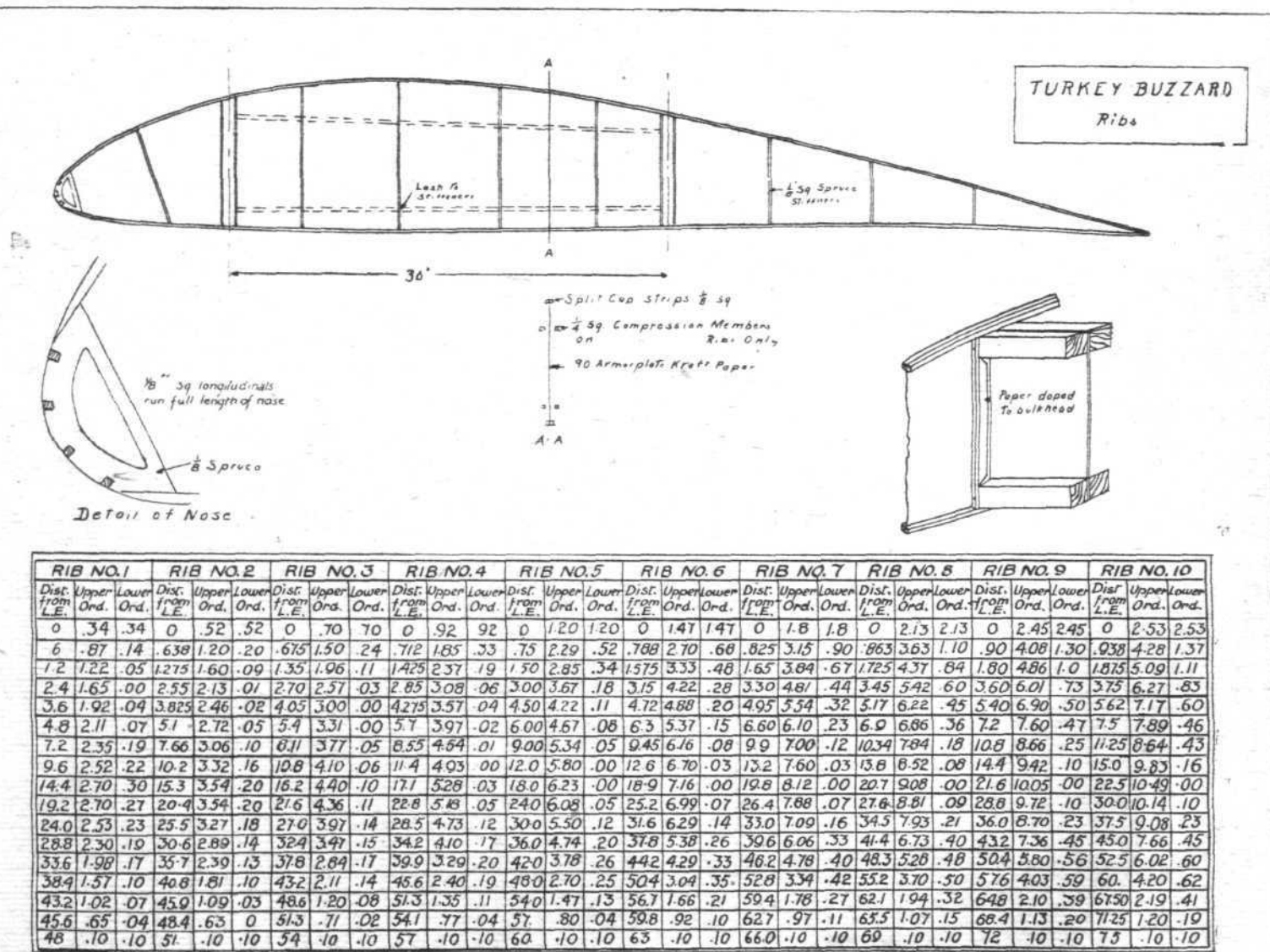
To return, in more detail, to the wing ribs, one of the accompanying drawings shows a typical rib, with the dimensions of the various ribs indicated in tabular form. The dimensions, as given in the table, are in inches, and not in fractions of the chord. As the webs are to be of paper, it

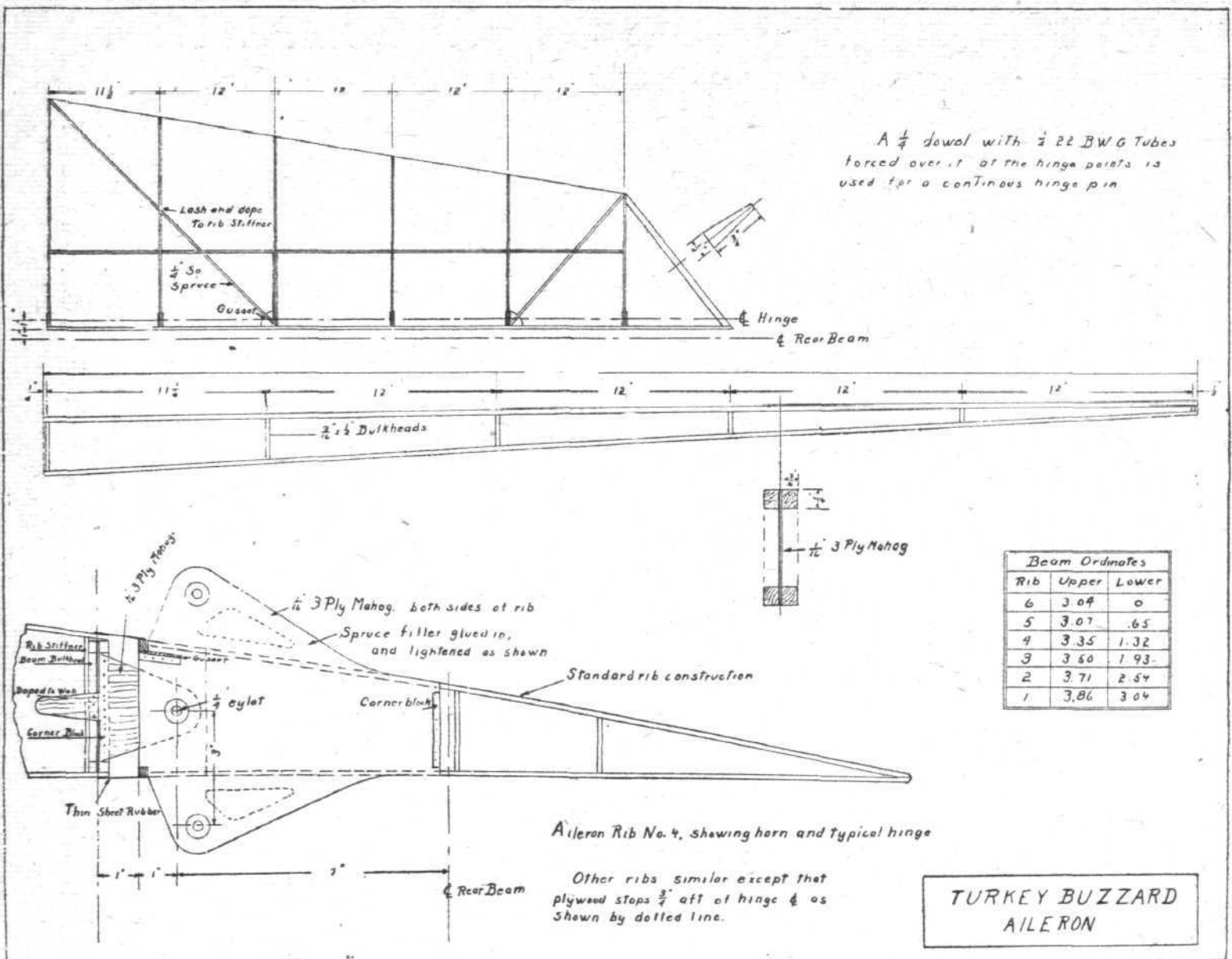
* The general arrangement drawings of "Turkey Buzzard" were published in our issue of April 12, 1923, and performance calculations, fuselage construction details, etc., on April 19, 1923.

will probably be a good plan to draw out on the actual cartridge paper to be used the sections full size. They can then be cut out in pairs (for the right and left hand sides of the wing) for the tapering portion of the wing, and in the case of the parallel portion of the wing the rib webs can probably be cut several at a time. Rib No. 10 is, of course, the Göttingen No. 426 section. The flanges, or "cap strips," are of spruce, $\frac{1}{8}$ in. square, and are doped to the cartridge paper web. Spruce stiffeners, also $\frac{1}{8}$ in. square, are placed vertically between upper and lower flanges at suitable intervals, and always against front and rear faces of the wing spars where these intersect the ribs.

In the case of the compression ribs a further strengthening is provided by horizontal fore-and-aft compression members of spruce $\frac{1}{8}$ in. square, running outside the vertical stiffeners, and lashed to them. Personally, we should prefer the compression ribs to be of the box-section type, with wider flanges than the normal ribs, and a thin ply-wood web on each side. The compression members serve, of course, for the internal drag bracing, of which it is intended there should be one set of wires in the plane of the upper compression members, and one set in the plane of the lower. This arrangement, or at any rate one very similar in principle, was used in the de Havilland cantilever monoplane, and gave, we believe, good results.

The leading edge of the wing is formed by $\frac{1}{8}$ -in. square spruce stringers, placed as shown on the rib drawings on $\frac{1}{8}$ -in. thick nose pieces of spruce. The whole leading edge is then to be covered with thick cartridge paper similar to that





"TURKEY BUZZARD": Details of aileron construction.

used for the rib webs. This paper leading edge is doped on to the stringers, and extends back to the rear face of the front wing spar. Usually three-ply wood is used for this purpose, but probably for a light glider paper will answer quite well.

The Wing Spars

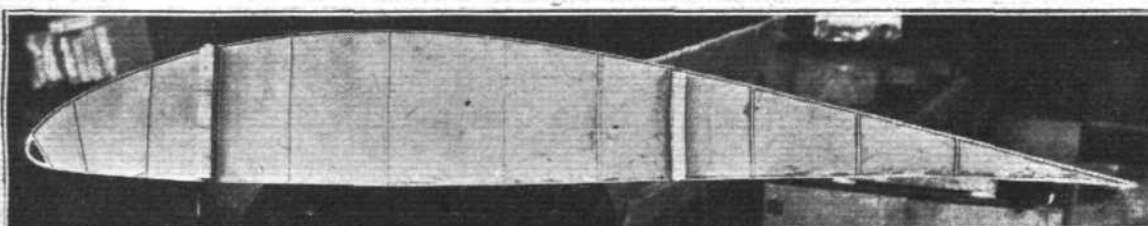
Another set of drawings shows the general lay-out of the wing, and gives details of the wing spars. These, as already mentioned, are built-up of three-ply mahogany ($\frac{1}{16}$ -in.) webs, with split flanges of spruce. The spruce strips used for the centre section, parallel portion of the spars measure $\frac{1}{16}$ in. by $\frac{1}{2}$ in. for the top flanges of both spars, and $\frac{1}{16}$ in. by $\frac{3}{8}$ in. for the lower flanges of both spars. The strips are placed, as shown in the drawings, with their largest dimensions vertical, forming, in the case of the upper flange, and counting in the thickness of three-ply spar web, a spar flange measuring $\frac{1}{16} + \frac{1}{16} + \frac{1}{16} = \frac{3}{16}$ in. wide by $\frac{1}{2}$ in. deep.

The dimensions of the tapering portion of the spar are given in the small table on the right-hand side of the sheet of drawings. The web is, of course, tapered in depth only, while the flange strips taper down to $\frac{1}{8}$ in. by $\frac{1}{4}$ in. at compression rib No. 1, as shown in the drawings.

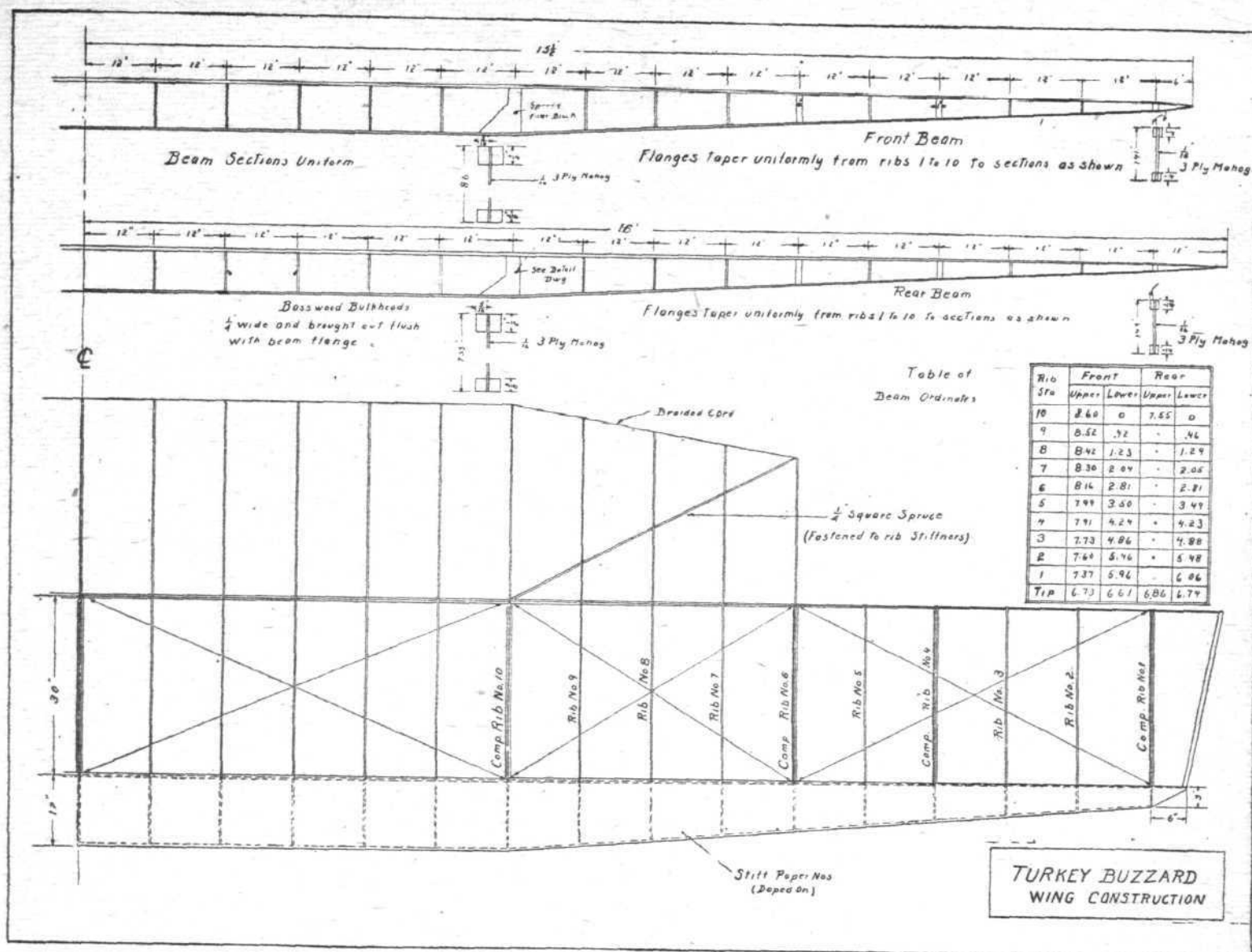
The trailing edge is formed by braided cord or "fish-line." The internal drag bracing is piano wire. No drawings are provided of the terminal fittings for the drag bracing, but presumably simple chain links secured by bolts to the spar would serve, strainers being incorporated in the wires. Possibly it is the intention of the designers that an arrangement similar to that shown for the fitting in the centre of the wing, at the point where the "A" struts to the body are attached, should be used. This takes the form of plain strips of steel passing over the spruce filler block, bent back and passed through slots in the spar web, the ends splayed out to the angle required by the bracing wire.

Ailerons

Generally speaking, the ailerons are of a construction similar to that of the wings. The aileron spars are built-up I-sections, with $\frac{1}{16}$ -in. three-ply mahogany webs and divided spruce flanges. The ribs are similar to the main ribs, except for the one shown in the drawing (No. 4), which carries the ailerons crank or king-post. The latter is made up of two pieces of $\frac{1}{16}$ -in. mahogany, placed one on each side of the rib, and having between them a spruce filler glued in and



"Turkey Buzzard": Photograph showing an experimental rib, which, for a 6-ft. chord, weighed 0.22 lb., and supported a load of 264 lbs. before breaking. The rib web is stiff cartridge paper.



"TURKEY BUZZARD": Details of wing construction.

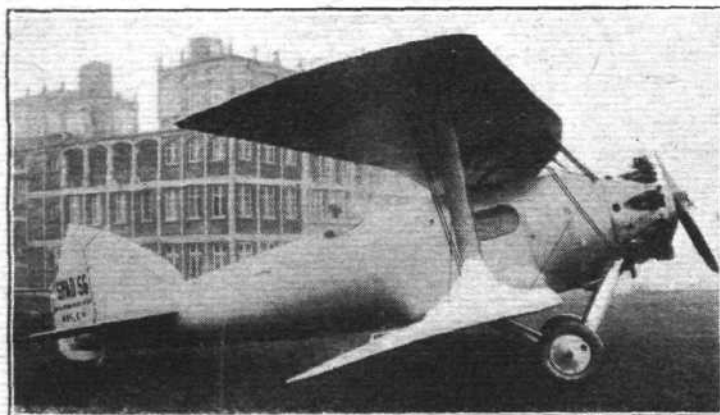
lightened as shown. The hinges are formed of three-ply plates, of spade shape as indicated in the drawings, with a continuous hinge pin formed of a 1/4-in. wood dowel rod, over which has been forced a length of 1/4-in. tube to form a bearing surface at the hinge points. Similarly a metal bush in the

form of an eyelet is formed on the three-ply plates which form the hinges. The trailing edge is a cord, as in the main wing, and the sloping end rib is of approximately triangular section, as indicated in the drawings.

(To be continued.)

The Incredible "Jupiter"

Just as we go to press it is learned that the Bristol "Jupiter" recently completed a series of runs, under the



A RECORD-BREAKER: The Spad 56 on which Casale has recently established world's altitude records. The machine is fitted with a Bristol "Jupiter" engine, manufactured in France by the Gnome and Rhone Co.

official supervision of the A.I.D., totalling 150 hours. Included in this total was one non-stop run of 50 hours, with the engine running at 90 per cent. of its full power. This probably constitutes a world's record, and certainly no radial air-cooled engine of anything approaching the same power and weight as the Bristol "Jupiter" has ever completed such a gruelling test. It would seem that this wonderful performance disposes once and for all of any doubts which may still linger in the minds of some as to the reliability of the radial air-cooled type of aero engine. We understand that not only was the reliability demonstrated, but that on taking down the engine after the 150 hours' running, no major part was found to have worn more than .0005 of an inch.

It is of interest, as giving a mental picture of what a 50 hours' non-stop run really means, to estimate that if the engine had been fitted in a fast military machine, it would have covered the distance between Southampton to Cape Town in the 50 hours.

Air Mail Stamps and Correspondence

THE Editor of FLIGHT invites correspondents throughout the world to send him letters (addressed to 36, Great Queen Street, Kingsway, London) by their national or local air mails. These will have special and personal acknowledgment in the Editorial columns of FLIGHT, and help to encourage the more general use of the air for mail carrying. The Editor would also greatly appreciate any items of interest or news relating to air mail services and air stamps.

LONDON TERMINAL AERODROME

Monday evening, April 23, 1923

THE Handley Page Transport are making successful and determined efforts to capture the bulk of the passenger traffic between London and Paris. During the past week they have run two machines a day in each direction and have carried several hundred passengers, in addition large quantities of freight. They are altering their machines—as rapidly as possible under the circumstances—to accommodate 14 passengers, and on several occasions have had full loads of 14 travellers in machines already converted. The traffic between London and Paris continues to increase by leaps and bounds. There is much speculation as to what it will grow to in the height of the season.

The Air Union continue to run their early morning paper service from Lympe to Paris with persistent regularity, and London newspapers are now often on sale in Paris before 9 a.m. On the return journey from Paris to London this French air combination are handling very large quantities of goods, and their Customs clerks are kept working practically every day until a later hour dealing with this air-borne merchandise.

Air Week-enders

BEWTEEN London and Cologne the Instone Air Line are experiencing a steady increase in passenger traffic, and also in special consignments of freight which—though they do not undertake the ordinary freight service—are sometimes a paying proposition. It is remarkable the number of people who wish to go to Cologne for the week-end, leaving London on Saturday and returning on Monday, and in this respect there is, fortunately, an equally heavy passenger list from the return direction, this being probably due to the officers in the Army of Occupation taking a flying week-end in London. This past week-end, both on Saturday and today, the service in each direction had to be run in duplicate to accommodate these air week-enders, and on Saturday all the machines made successful journeys, although there was such a strong wind that the cross-channel steamers were blown back into Dover Harbour. On this day Mr. P. D. Robins, piloting one of the Napier's 34's from Cologne to London with seven passengers, set up a new record by covering the journey in 2 hrs. 40 mins.



The New Speed Cup

THE Coupe Deutsch, having been won twice by a Nieuport machine, has become the property of that firm, and for some time there has been speculation as to what would take its place. The Aero Club de France now announces that a new international speed contest has been instituted by the American Commander Louis D. Beaumont, who offers a prize of 200,000 francs. The organisation of the race for the Beaumont Cup has been entrusted to the Aero Club de France, and will take place at Istres on October 14, over a 300 kilometres course. The Beaumont donation takes the form of two *objets d'art* valued at 25,000 francs each, and two cash prizes of 75,000 francs each.

During the week-end no fewer than six motor-cycles have been transported by air from London to Cologne, and I am informed that, judging from the number of enquiries received from motor-cycle firms, this traffic will eventually grow to quite formidable dimensions.

The Croydon police-sergeants' mess had their revenge for their defeat at billiards by an aerodrome team when, on Friday evening last, a party from the aerodrome visited the Croydon police headquarters and played their return game. The police scored a victory by 15 points, the score being police 600, aerodrome 585. The aerodrome representatives—Messrs. Shaw, Muir, Lloyd, Herne, Marchmont and Kirkland—were treated with great cordiality, and I understand this is to be the initial stage of a billiards league between airmen, soldiers, policeman and firemen in South London, a cup for competition having already been promised.

Tea Gardens and Palm Court for the 'Drome

THE Trust House has commenced alterations on a large scale to the old officers' mess on the south side of the main entrance to the aerodrome. This they are converting into a tea-room and tea-gardens, where there will also be accommodation for the serving of cold luncheons. I am given to understand that the courtyard between these buildings is to be roofed over and converted into a palm-court. It is hoped to have the alterations in such an advanced stage that, at any rate, a part can be opened by Whit-Monday. All the local schools are to be circulated, calling their attention to the educational value of Croydon aerodrome to the rising generation and pointing out these new catering facilities.

The Daimler Airway have started upon a scheme of alteration and enlargement of their engine repair-sheds, and are building a new wing on to their existing erections. Their service continues to run with the usual Daimler regularity and their machines are still piling up mileage. It is unfortunate that at present the London-Amsterdam route does not appear to be so well-patronised as the other two routes covered by British companies, but the enquiries and advance bookings for the extension to Berlin give every indication that this state of affairs will cease with the opening on April 30 of the through connections with Copenhagen, Hamburg and Berlin.

The winner of the first race will receive, provided he has exceeded a speed of 290 kilometres (180 miles) per hour, the first prize of 75,000 francs. The second 75,000 francs will be awarded to next year's winner. With regard to the two *objets d'art*, the Aero Club de France announces, rather amusingly, that these will be awarded as follows: One to the constructor, and one to the pilot who shall have attained the greatest speed in the two contests. (We look forward to seeing, for instance, Mr. Folland and M. Delage running a cross-country race at Istres.) Entries must be made before 6 p.m. on August 1, 1923, to the Commission d'Aviation de l'Aero Club de France, 35 Rue François Ier, Paris, from whom all further information can be obtained.



THIRTY-SIX HOURS IN THE AIR : On April 18 Lieuts. J. A. Macready and Oakley C. Kelly, of the U.S. Army Air Service, established a world-record endurance flight at Dayton, Ohio, when, flying over a triangular course of about 31 miles, they remained aloft for 36 hrs. 5 mins. 20 secs., and covered 2,541.2 miles. The machine they used, shown above, is the same Fokker F.N. with 400 h.p. high-compression Liberty on which they flew for 35 hrs. last year. Fuel for 44 hrs. weighing 10,500 lbs. was carried.

THE ROYAL AIR FORCE

London Gazette, April 17, 1923

General Duties Branch

Flight-Lieut. C. N. Lowe, M.C., D.F.C., is granted a permanent commission in rank stated (January 12, 1921) (*Gazette*, January 28, 1921, appointing him to a short-service commission is cancelled).

The following are granted short service commissions, for seven years on active list as Flying Officers, with effect from and seniority of dates indicated: M. W. J. Boxal, (Capt., Indian Army, retired), A. E. G. Forrest (Capt. Indian Army, retired), D. C. H. Ferguson (Lieut. Indian Army, retired), W. F. R. Gough (Lieut., R.N., retired), H. T. Herring (Lieut., R.N., retired), R. Jaques (Lieut., R.A.R.O., Army Educational Corps), A. N. MacNeal (Lieut., R.N., retired), R. H. S. Peter (Lieut., R.N., retired); April 3. R. Kennedy (Lieut., R.N., retired); April 4. Flying Officer J. T. Hall to take rank and precedence as if his appointment as Flying Officer bore date September 26, 1921, immediately following Flying Officer S. W. Smith (reduction to take effect from March 15).

Stores Branch

The following are granted permanent commissions for accountant duties as Flying Officers; January 15, 1921. (*Gazette* April 25, 1921, appointing them to short service commissions, is cancelled):—E. V. Humphrey, E. C. M. Knott (substituted for *Gazette* April 6, 1923).

Medical Branch

The following are granted permanent commissions as Flight-Lieuts., with effect from dates indicated. (*Gazettes* of dates indicated in brackets, appointing them to short service commissions, are cancelled):—J. R. Crolus, M.B.; October 19, 1921 (November 1, 1921). J. M. A. Costello, M.C., M.D., M.Sc., May 1, 1922 (May 16, 1922), since promoted. C. A. Meaden is granted a temporary commission as a Flight-Lieut., with effect from, and with seniority of, April 3.

Reserve of Air Force Officers

Class A.—C. F. Uwins is granted commission in General Duties Branch as Flying Officer on probation; April 7.

London Gazette, April 20, 1923

General Duties Branch

The following Pilot Officers on probation are confirmed in rank:—J. O. Barnes, C. E. N. Guest, G. G. Hopkins, D. G. Pinnell, A. M. Rowe, F. R. D. Swain; February 21. R. C. Brooke-Hunt (since deceased), H. C. E. C. P. Dalrymple, J. H. G. Franklin, L. E. Maynard, N. P. C. Mellor, H. V. Michell

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the R.A.F. are notified:—

General Duties Branch

Group Captains: A. G. Board, C.M.G., D.S.O., to R.A.F. Depot pending disposal. 16.4.23. P. B. Joubert de la Ferte, C.M.G., D.S.O., to Air Ministry 16.4.23; on appointment as Deputy Director of Personnel.

Wing Commanders: H. J. Brock, D.S.O.; G. R. Bromet, D.S.O., O.B.E., and A. H. Jackson; to R.A.F. Staff College, Andover. For Staff Course. 1.5.23. S. Grant-Dalton, D.S.O., A.F.C., to Headquarters, Coastal Area, pending disposal. 16.4.23.

Squadron Leaders: J. C. Quinell, D.F.C.; A. A. Walser, M.C., D.F.C.; R. M. Hill, M.C., A.F.C.; Sir N. R. A. D. Leslie, Bt., C.B.E.; G. W. M. Green, D.S.O., M.C.; D. G. Donald, D.F.C., A.F.C.; R. M. Bayley, D.F.C.; C. H. Elliott-Smith, A.F.C.; J. C. Russell, D.S.O.; and A. N. Gallehawk, A.F.C., to R.A.F. Staff College, Andover, for Staff Course. 1.5.23. P. A. Shepherd to No. 3 Group Headquarters, Spittlegate. 16.4.23. E. H. Sparling, A.F.C., to Air Ministry. 1.5.23. T. L. Leigh-Mallory, D.S.O., to Air Ministry. 7.5.23. W. S. Douglas, M.C., D.F.C., and C. W. H. Pulford, O.B.E., A.F.C., to Air Ministry. 1.5.23. J. C. M. Lowe, to R.A.F. Depot. 1.5.23. C. F. A. Portal, D.S.O., M.C., to Air Ministry. 10.4.23. L. L.

B. N. Murgatroyd, R. V. M. Odber, A. J. Peacey, W. H. Phillips, C. J. Pooley, W. J. E. Rodwell, A. E. Stewart, O. B. Swain, W. P. Wiltshire, T. J. Woods, L. B. W. B. Wride (since deceased); March 2. E. C. Roark, W. H. Ryder; March 9.

Flying Officer R. V. Weeks to take rank and precedence as if his appointment as Flying Officer bore date October 1, 1919, immediately following Flying Officer W. Wheatley. Reduction to take effect from March 19; Flight-Lieut. P. G. N. Ommanney is placed on half-pay, Scale B, from August 11, 1922, to April 3, 1923, inclusive. (Substituted for *Gazette*, September 8, 1922.) Since resigned.

The following are transferred to Reserve (April 20):—

Class B.—Observer Officer F. A. Whippey, D.F.C.

Class C.—Flying Officer H. J. T. Russell.

Reserve of Air Force Officers

Class A.—The following are granted commissions on probation in General Duties Branch in ranks stated (April 20):—

Flying Officers.—R. C. Armstrong, J. R. Astin, H. H. W. Bean, G. R. Beck, P. A. F. Belton, P. A. A. Boss, L. G. Brazier, H. E. Browne, C. J. Chabot, P. G. Clarabut, J. H. Colbert, W. E. C. Coombs, F. T. Courtney, A. W. Day, R. Duncanson, S. H. Gaskell, H. M. Gibbs, R. C. D'A. Gifford, J. L. S. Gill, G. T. Griffith, J. O. Groves, F. W. Hartridge, E. W. Jordan, J. C. Joynt, M. M. Kaye, W. F. Knight, H. E. W. Macandrew, J. L. Mayer, L. F. Mead, R. R. Money, A. L. Monger, F. G. S. Musson, M. A. Newnham, E. E. Owen, P. Phillips, C. A. Pike, B. C. Rice, E. G. Richardson, F. G. Saunders, J. Stanley, T. F. Steele, D. J. Stewart, R. H. Stocken, S. E. Taylor, N. H. Thackrah, J. W. Thomson, C. T. Travers, T. B. Tully, A. E. Ward, J. G. Weir, H. M. Yeatman.

Pilot Officers.—W. Anderson, T. E. W. Browne, C. Bunch, J. R. Cox, J. Craig, V. N. Dickinson, M. R. Dynes, W. G. A. Freke, J. F. Greenwood, W. Harmston, J. E. Hunt, R. W. Jackson, R. C. Knowles, G. C. D. Lindsay, G. A. Milbank, F. Neale, J. T. Newton, R. Niven, N. J. Nock, W. C. Osborn, W. R. Parkhouse, G. Richardson, A. E. Roberts, C. E. F. Searle, R. A. Seaton, R. R. Spencer, A. J. Stubbings, D. L. Townsend, A. M. Verity, E. J. Wing, G. T. Witcombe.

Class A.A. Pilot Officers.—W. J. Beaumont, R. H. Leavey.

Memoranda

Sec. Lieut. J. B. Young to be Lieut. (Ad.), without pay and allowances of that rank whilst so employed; November 4, 1918.

The permission granted to Sec. Lieut. J. H. Walton to retain his rank is withdrawn on his joining the Army; March 29.

MacLean to Air Ministry. 16.4.23. R. M. Drummond, D.S.O., O.B.E., M.C. to Air Ministry. 12.4.23.

Flight Lieutenants: D. F. Stevenson, D.S.O., M.C.; M. Thomas, D.F.C., A.F.C.; J. A. Glen, D.S.C.; A. G. Bishop, A.F.C.; L. H. Cockey; F. M. F. West, V.C., M.C.; and K. L. Harris, to R.A.F. Staff College, Andover, for Staff Course. 1.5.23. G. N. Lowe, M.C., D.F.C., to R.A.F. Depot. 27.4.23. D. W. Grinnell-Milne, M.C., D.F.C., to Air Section, British Delegation, Paris. 14.4.23. L. Wanless-O'Gowan to Air Ministry. 21.4.23. W. F. Dickson, D.S.O., A.F.C., to Air Ministry. 1.5.23. H. Dawes, M.B.E., to No. 24 Squadron, Kenley. 1.5.23.

Flying Officers: D. G. Brodie to No. 4 Flying Training School, Egypt, for course of instruction. 24.1.23. R. O. Riggs to No. 100 Squadron, Spittlegate, for course of instruction. 10.4.23.

Stores Branch

Flight-Lieutenant: F. Paterson to C. and M. Party Donibristle. 1.4.23.

Medical Branch

Flight-Lieutenant: R. S. Topham, M.B., D.P.H., to No. 56 Squadron, Hawkinge. 13.4.23.

IN PARLIAMENT

Great Britain and United States Aircraft Patents

MAJOR SIR GEORGE HAMILTON on April 17 asked the Chancellor of the Exchequer: (1) Whether, seeing that His Majesty's Government has had to pay large sums to British patentees for the use of their patents by the United States of America after the United States had entered the War, he will say approximately what sums were and will be so paid; and whether the United States will refund to this country such payments; (2) whether the British Government has been called upon by the United States of America to pay for the use of aircraft patents which were taken out in America before the United States entered the War; and whether he is aware that the British Government, to assist the United States, informed them that they could use any British patents which would assist them in the War?

Major Boyd-Carpenter: After the entry of the United States of America into the War in 1917, it was found necessary, in order to increase the common output of aeronautical material, to manufacture in America certain types of British aeroplanes, engines and accessories. This course involved the disclosure to American manufacturers by British aircraft firms of certain patents, designs, and specifications, and also the supply of technical information and assistance. The War Cabinet decided that His Majesty's Government should be responsible during the War for any consequential financial arrangements to be made with the British manufacturers, the United States Government accepting financial liability arising in respect of post-War production in that country. The total sum paid and payable by His Majesty's Government under this arrangement is approximately £105,000, which is not recoverable from the United States of America. Only a trifling proportion of this amount, approximately £300, is for the use of aircraft patents taken out in America before the United States of America entered the War.

Sir George Hamilton asked whether there are now pending large claims for royalties in respect of alleged infringement by the British Air Force of patents owned by the Curtiss Aeroplane Co., which is an American company; and whether the United States of America have undertaken to pay any compensation which may be given against the British Government for the use of such patents?

Major Boyd-Carpenter: The Curtiss Aeroplane Co. presented, but subsequently withdrew, a claim in respect of the use of their patents; they have, however, now made a claim for an *ex gratia* award in respect of the use of their designs of flying boats a 1 of services rendered by them. The claim relates substantially to the early part of the War, 1915-16, before the United States became a belligerent. There is no ground upon which the United States Government could be asked, nor has that Government undertaken, to repay any compensation which may be payable by the British Government to the company.

Air Ministry Women Employees

MR. F. HALL, on April 19, asked the Secretary of State for Air what was the highest figure reached in his Department for the employment of women prior to 1920 in the following civilian grades: Temporary typists and shorthand typists, temporary clerks below the rank of junior administrative assistant, and officers of junior administrative rank or over?

Sir S. Hoare: According to the records available, the maximum numbers of women employed in the Air Ministry prior to 1920 in the grades referred to were:—

Temporary typists and shorthand typists	293
Temporary clerks below the rank of junior administrative assistant	1,035
Junior administrative assistants and higher ranks	51

British Aviation Exhibit, Gothenburg

SIR H. BRITAIN asked the Secretary of State for Air whether he is able to give any further information as to the participation by British exhibitors in the forthcoming exhibition at Gothenburg; and to outline in what particular manner his Department is prepared to assist them?

Sir S. Hoare: Yes, Sir. I am glad to say that considerable progress has been made. The Committee to which I referred in my reply on March 22 to Rear-Admiral Sueter, Member for Hertford, has considered proposals submitted by the Society of British Aircraft Constructors, Ltd., on behalf of the British air industry, for the despatch of a representative British exhibit to Gothenburg. I hope that the Air Ministry will be able to make a substantial contribution in aid of the expenditure which will be involved.

British Air Lines and Czecho-Slovakia

LIEUT.-COMMANDER KENWORTHY asked whether the text had been received of the recently concluded aviation convention between France and Czecho-Slovakia; whether it provides for the exclusive manufacture of aeroplanes built by foreigners for Czecho-Slovakia to French manufacturers; and what steps are being taken to preserve rights in this market for British aeroplane manufacturers?

Capt. Wedgwood Benn asked whether any statement could be made as to the air agreement between France and Czecho-Slovakia?

Sir S. Hoare: I am not yet in possession of the text of the agreement in question, but I am endeavouring to obtain it and will communicate with the hon. and gallant members as soon as I have received it. I may say, however, that I have been carefully watching aeronautical developments in Czecho-Slovakia, and already have under consideration an agreement with the Czecho-Slovakia Government regarding the extension of existing British air lines through Czecho-Slovakia.

THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

(London Aero Models Association)

KEENNESS is undoubtedly growing in the S.M.A.E.E., if heated arguments are any indication. The Meeting at Headquarters on Friday last was spent in a running fire of questions, answers and opinions between the members, on a number of technical subjects. It is an excellent thing to see the readiness with which the more experienced members offer their help to those who are in difficulties of any kind. Mr. C. J. Burchell has very kindly offered to give a practical demonstration of fuselage covering, that tricky little process which so often baffles the beginner, on Friday next, the 27th inst. Even the very stiff breeze which moaned round the chimney pots of London all day on Sunday last failed to damp the ardour of fourteen members who arrived at Parliament Hill Fields with models of all types and sizes. Some of them anticipating crashes brought a spare machine in the tool box, and some very fine flights were made.

Mr. Lansdown turned out with a veritable giant glider, but appeared rather nervous of being taken up by it, as he has no licence.

A rubber-driven offspring of the "Daddy-long-legs" tribe put up a very fine performance. So much so that although it started the day at Hampstead it finished at Ealing.

We would again point out that the second round of the "Pilcher Cup" competition will be held at Wanstead Flats at 3.30 p.m. on Saturday, April 28, and we expect a lot of visitors.

There will also, as stated above, be the usual Meeting at 20, Great Windmill Street, Piccadilly, at 7.30 p.m. on Friday, 27th. Note that there is plenty of room and plenty of hospitality.

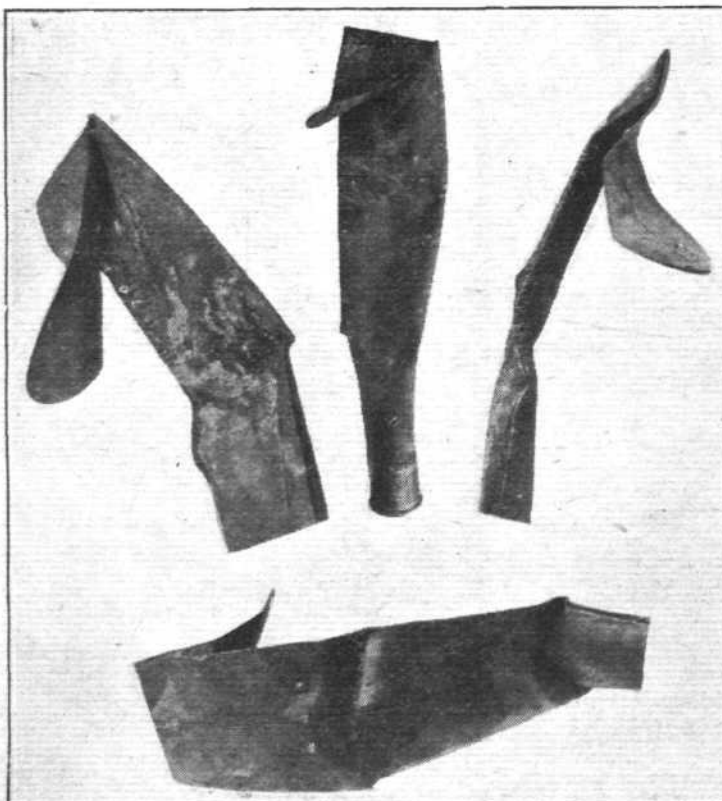
A. E. JONES, Hon. Sec.

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Air Mail from Liners

TOMORROW, Friday, an Instone aeroplane will meet a liner arriving from America in order to bring the mails to London. A dummy postal packet will be dropped overboard, picked up by a fast motor-boat, which will convey it up Cattewater to Chelson Meadow, where the aeroplane will pick up the packet and convey it to London.

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BENT BUT NOT BROKEN!: This photograph shows the blades of a Leitner-Watts metal airscrew which was damaged owing to the aeroplane on which it was fitted being blown over on to its nose on the aerodrome during a gale. It will be observed that both the sheet metal, the small struts and the welded seams have withstood the shock without fracturing.



A TESTIMONIAL FROM JAPAN: Our photograph shows a diploma acknowledging the good work done by the Aircraft Disposal Co. in Japan, particularly in connection with the Aircraft Exhibition at Tokyo.

PUBLICATIONS RECEIVED.

Royal Aero Club Year Book, 1920-21-22-23. The Royal Aero Club of the United Kingdom, 3, Clifford Street, London, W. 1.

That Man Durant. By W. A. P. John. Durant Motors, Ltd., 245, Oxford Street, W. 1.

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AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1921

Published April 26, 1923

- 5,238. SOC. ANON. ANC. ETAB. BARBIER, BENARD ET TURENNE. Device for automatically substituting one source of light for another in lighthouses. (180,632.)
- 11,759. RAUL, MARQUIS OF PATERAS PESCARA. Aircraft. (179,176.)
- 11,858. RAUL, MARQUIS OF PATERAS PESCARA. Supporting systems for aerial machines. (179,182.)
- 17,013. J. W. SLEIGHT. Instrument for measuring pitch of propellers. (195,558.)
- 19,374. G. H. HARDY. Rotary engine. (195,563.)
- 21,739. J. J. M. A. E. SCHNEIDER. Arming of aeroplanes. (191,700.)

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